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U.S. PATENT APPLICATION

SELF-CONTAINED OCTOPUS ADAPTOR TAP

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TITLE

SELF-CONTAINED OCTOPUS ADAPTOR TAP

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FIELD OF THE INVENTION

This invention relates generally to beer dispensing equipment and specifically to taps for beer kegs.

CROSS REFERENCE TO RELATED APPLICATION

This application and device claim the benefit of provisional application number 60/433,338 filed in the United States Patent and Trademark Office on December 12th, 2002 and entitled SELF-CONTAINED OCTOPUS ADAPTER TAP in the name of the same inventors, Cody Payne and Ryan Welch.

STATEMENT REGARDING FEDERALLY FUNDED RESEARCH

This invention was not made under contract with any agency or branch of the United States Government.

BACKGROUND OF THE INVENTION

Beer and certain other liquids customarily come in kegs, large metal containers having provision for some type of "tap" to be installed. Kegs further allow pressure to be introduced to the interior of the keg so as to force beer out of the keg under pressure.

Usually, a valve present in the top of the keg is used for this purpose. Air or other gas under pressure is introduced into the keg through the valve and beer is allowed to escape from the valve. In one normal arrangement, the valve (often a ball valve) allows air to enter around the periphery of the ball while beer goes up via another channel through the valve. Such a beer channel through the ball valve may be elongated into a 'stem' which projects deeply into the keg, for example, to at or near the bottom of the keg interior. Opening the valve is not accomplished by pressure of beer or gas from within but rather by mechanical force or pressure applied to the ball valve or a piercing rod. This mechanical force is applied by the first of a series of accessory devices, couplings, pumps and other devices which sequentially take gas into the keg and beer out of it. A typical initial device would be the trademarked "Sanke Adaptor" (alt. spelling "Sankey") which screws into large detents around the ball valve on the keg. A lever on some Sanke style devices then acts to force open the ball valve, other types open it automatically as they are put onto the keg. A second coupling, male or female and often on top, completes the

Sanke device.

The system of large threads/detents plus ball valves is used in the "Sanke" adaptor (trademark) system, other common coupling systems include the European "Sanke" system, other European systems, the Guinness (trademark) style, piercing rods, the ball lock, various types of threaded couples, and so on.

In a typical set-up, a coupling on the bottom of an air pump such as a "Bronco" pump (TM of NADS, Inc., not related to present applicants) is used to secure the pump to a complementary coupling on a Sanke device and thus to the keg. The pump has a pair of channels therethrough, one for "beer out" and one for "air in". Small extension tubes on various couplings may extend the channels beyond the length of the coupling, pump or other device itself. When the pump is actuated, air is forced down the coupling and ball valve into the keg. Beer, urged by the internal pressure of the keg, then travels up through the sequence of channels in the Sanke valve and the pump, out via a beer outlet, down a hose line connected to the beer outlet, and out through a faucet normally having a small valve and thence into a mug or cup.

The pressure that such a pump can generate is naturally limited, particularly in models in which pressure is created by actuating a hand pump. Low pressure is safer and easily sufficient for the typical single faucet and thus single outlet: from one outlet, a sufficient flow of beer can be maintained. Excess pressure may also be a problem in such keg/beer flow devices systems ("taps"), for which situations pressure relief valves may be supplied. Similarly, the channel size through the pump and coupling is normally dimensioned and configured to allow the beer (essentially an incompressible fluid) to flow in sufficient quantity. Pressure also arises (to a degree) from the chemistry of the beer within the keg, occasionally causing too much or too little

pressure depending upon circumstances.

Tap assemblies made up from the various devices (a Sanke tap with a hand pump on top, for instance) are more flexible than single piece tap assemblies. If a given pump is undesirable, it may be changed without removing the adapter from the beer keg, while if a given adapter is the wrong type for a given keg, it may be switch while retaining the use of an optimal pump. Thus, such tap assemblies are superior in some respects to single piece taps.

Kegs, however, are normally utilized in distinctly social settings of large groups of people. Under such circumstances, it is quite normal for several people to simultaneously desire refreshment. At that point, a single faucet becomes a bottle neck to efficient distribution of the beverage. One solution is to attempt to use more than one faucet on a given keg.

Problems arise however when the attempt is made to take off more than a single faucet. This allows simultaneous service of more than one beer mug at one time. However, there are inherent limitations to this approach. As mentioned, the pressure of the pump may not allow adequate flow to a plurality of faucets. The channels through the coupling and especially through the three hoses may not have sufficient cross sectional area to allow adequate flow, regardless of pressure. Such a multiple faucet starts out as a single hose line fed by a single beer outlet of normal size. The single beer outlet inherently restricts flow, while increasing the size of a single beer outlet would not by itself suffice to increase flow unless the channels feeding the outlet were also increased in diameter.

US Patent No. 5,332,132 issued Jul. 26, 1994 to Schuske for MULTI SPOUT BEER VALVE teaches that a hand pump may be modified by the addition of multiple beer outlets and a widened beer channel. However, that invention does not teach that multiple outlets may be

provided by means of any truly self contained device capable of being used with existing pumps and adapters in an assembled tap, but rather only in a single piece tap device.

Other methods teach multiple ball valves scattered on the keg with each serving a faucet. This is undesirable simply because the standard keg is not designed to have several such ball valves. Yet another device for increasing flow is a "coupler" at the keg which has a side mounted inlet for gas entrance to the coupler and thence to the keg. The gas used is commonly CO_2, but may be other suitable gases such as N_2, which is used in some systems and styles in the UK. The pressure from the CO_2 gas then serves in place of the air to force beer out, vertically through the coupler and to a faucet. By use of a large commercial CO_2 cannister external to the keg, a large supply of CO_2 under pressure is created. However, this tap system has various problems as well. The large commercial CO_2 cannister is bulky and heavy, being designed for use in a restaurant, bar, or with a soda fountain at a fast food restaurant or other very high volume fixed operation rather than a single keg of beer. The natural result is that the capacity of the device is also excess to typical needs. In addition, the separate CO_2 cannister requires a hose line leading from it to the coupling, making for a larger and more bunglesome set of containers instead of a single container.

An advantage of CO_2 in the beer application is that carbon dioxide is a natural byproduct of beer fermentation, while ambient air is disadvantageous because it can contaminate beer via oxidation, or allow outgassing of the CO_2.

It would be preferable to provide a truly self contained adapter which could be used with a number of different existing pumps and adapters. In addition, it would be preferable to provide means of allowing maintenance of a steady high pressure within such a tap system.

It would be preferable to have a device allowing use of multiple faucets without compromising fluid flow rates. Such a device should allow easy maintenance of a steady high pressure within the tap system and should allow easy retrofitting of a multiple faucet device to pumps and adapters not originally designed for multiple tap use.

SUMMARY OF THE INVENTION

General Summary

The present invention teaches that a self-contained adapter may be utilized to allow multiple faucets from a single keg, but without the inherent flow limitations of using a single hose line to feed multiple faucets.

The self-contained octopus adapter of the invention sits between the pump and the Sanke adaptor and transmits beer out and air in through channels similar to those in the devices on either side. However, the adapter may have a beer channel of increased diameter and the beer channel may lead to a plurality take offs which may each serve one faucet. Thus, the beer supply for the plurality of faucets is not sent through a single beer outlet/single hose line and the flow of beer or other beverage may be increased. Seals on the device will aid in maintenance of pressure and avoidance of leaks. No division of the hose lines is necessary, nor external pressure/volume increases, and thus the unit is self-contained.

In an alternative embodiment, the invention may comprise a self-contained pump replacement unit having a CO_2 cartridge or other gas cartridge which sits upon the various devices of the beer flow path and provides CO_2 from above. The CO_2 cartridge may be sized to

the needs of a single beer keg, a multiple of beer kegs or other factor allowing the cartridge to be smaller than the normal commercial size suitable to a soda fountain. In addition, by placing the CO_2 cartridge in fluid connection and physical connection atop the connectors, a single self-contained package is maintained.

Summary in Reference to Claims

It is another aspect, advantage, objective and embodiment of the present invention to provide a self-contained beer keg tap adapter for use between first and second beer keg flow devices, the tap adapter comprising: a unitary body having a lower surface and an upper surface; a first coupling located at the lower surface of the body, the first coupling dimensioned and configured to adapt to such first beer keg flow device; a second coupling located at the upper surface of the body, the second coupling dimensioned and configured to adapt to such second beer keg flow device; a plurality of beer outlets; a first air channel through the body from the second coupling to the first coupling, the first air channel fluidically connecting the upper surface and the lower surface, thereby allowing passage of air through the body from the second beer keg flow device to the first beer keg flow device; and a first beer channel through the body from the first coupling to the plurality of beer outlets, the first beer channel fluidically connecting the lower surface of the body and each of the plurality of beer outlets, thereby allowing passage of beer through the body from the first beer keg flow device to each of the plurality of beer outlets.

It is another aspect, advantage, objective and embodiment of the present invention to provide a tap adapter wherein the unitary body is comprised of a material selected from the group consisting of: HDPE, other plastic, other polymer, food grade stainless steel, other stainless steel,

brass, aluminum, other metal, wood, carbon composite, and combinations thereof.

It is another aspect, advantage, objective and embodiment of the present invention to provide a tap adapter wherein the first coupling comprises threads physically complementary to the upper end of such first flow device.

It is another aspect, advantage, objective and embodiment of the present invention to provide a tap adapter wherein the second coupling comprises threads physically complementary to the lower end of such second flow device.

It is another aspect, advantage, objective and embodiment of the present invention to provide a tap adapter wherein such first flow device further comprises a coupler and further wherein such second flow device further comprises a pump, and further wherein the first coupling is identical to the upper end of such coupler and further wherein the second coupling is identical to the lower end of such pump.

It is another aspect, advantage, objective and embodiment of the present invention to provide a tap adapter wherein such pump, such coupler and the first and second couplings of the unitary body are coaxially located about a central vertical axis extending therethrough.

It is another aspect, advantage, objective and embodiment of the present invention to provide a tap adapter wherein the first beer channel extends partially along the vertical axis through the unitary body.

It is another aspect, advantage, objective and embodiment of the present invention to provide a tap adapter wherein the first air channel is substantially parallel to the vertical axis and offset therefrom.

It is another aspect, advantage, objective and embodiment of the present invention to

provide a tap adapter further comprising: a toroidal channel located in the second coupling, the toroidal channel and the first air channel being fluidically connected.

It is another aspect, advantage, objective and embodiment of the present invention to provide a tap adapter further comprising: a first seal disposed about the first beer channel in the second coupling.

It is another aspect, advantage, objective and embodiment of the present invention to provide a tap adapter further comprising: a second seal disposed about the first air channel in the second coupling.

It is another aspect, advantage, objective and embodiment of the present invention to provide a tap adapter wherein the first and second seals further comprise O-rings.

It is another aspect, advantage, objective and embodiment of the present invention to provide a tap adapter wherein the beer outlets further comprise: cylindrical projections from the unitary body, each interior cannula of each cylindrical projection fluidically connected to the beer outlet, whereby beer may flow freely from the beer outlet through the cylindrical projection.

It is another aspect, advantage, objective and embodiment of the present invention to provide a tap adapter wherein each beer outlet is further dimensioned and configured to receive at least one member selected from the group consisting of: a beer hose line, a tap, a faucet, or combinations thereof.

It is another aspect, advantage, objective and embodiment of the present invention to provide a tap adapter wherein the first beer channel is fluidically connected to each of the plurality of beer outlets by at least one segment connecting each beer outlet to a central junction, the central junction fluidically connected to the first beer channel.

It is another aspect, advantage, objective and embodiment of the present invention to provide a tap adapter wherein the first beer channel is substantially vertical and the at least one segment makes an angle of over 90 degrees with the first beer channel.

It is another aspect, advantage, objective and embodiment of the present invention to provide an improved self-contained beer keg pump comprising: a beer outlet dimensioned and configured to receive a hose line to a beer faucet; a first coupling below the beer outlet, the first coupling dimensioned and configured to mate to a first beer keg flow device; a second coupling above the beer outlet, the second coupling dimensioned and configured to attach to a gas cartridge in fluidic communication therewith; a gas cartridge capable of containing a first given quantity of gas at a first given pressure; the gas cartridge being attached into fluidic communication with the second coupling; wherein the first given quantity of gas at the first given pressure is sufficient to empty a single beer keg of beer.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a bottom view of the adapter of the present invention according to a first embodiment, presently preferred embodiment, and best mode now contemplated for carrying out the invention.

Fig. 2 is a is a cross-sectional view of the adapter of the present invention according to the first embodiment.

Fig. 3 is a side view of the adapter of the present invention according to the second

embodiment, showing the device in use.

Fig. 4 is a side view of the adapter of the present invention according to a third embodiment, showing the device in use.

Fig. 5 is a side view of the adapter of the present invention according to a fourth embodiment.

Fig. 6 is a bottom elevational perspective view of the fourth embodiment of the invention, showing additional details.

Fig. 7 is a cross sectional side view of a fifth embodiment of the invention in a first sectional plane.

Fig. 8 is a partial and transparent side view of a sixth embodiment of the invention in a second sectional plane, in which the air channels previously invisible in the embodiment shown in Fig. 7 are visible.

Fig. 9 is a cross sectional side view of a cylindrical projection according to a seventh embodiment of the invention.

Fig. 10 is a top elevational perspective view of an eighth embodiment of the present invention.

Fig. 11 cross sectional and top elevational perspective view of the eighth embodiment of the present invention.

INDEX OF REFERENCE NUMERALS

100 Device

101 Screw threads

102 Beer channel

103 Beer flow gasket

104 Air channel

105 Air gasket

106 Beer outlet

107 Beer outlet

108 Beer outlet

109 Junction

110 Unitary Body

200 Adapter

206 Beer outlet

212 Pump

214 Button

216 Pressure relief valve

218 Coupler

220 Coupler

222 Lower portion of coupler

224 Shank

300 Adapter

306 Beer outlet

308 Beer outlet

318 Coupling

320 Coupling

324 Shank

322 Lower portion

332 Coupling

330 Improved Pump

334 Coupling

336 Flow control device

340 CO_2 bottle

400 Fourth embodiment

401 Screw threads

402 Beer channel

404 Air channel

406 Beer outlet

407 Beer outlet

408 Beer outlet

410 Unitary body

418 Second coupling

420 First coupling

450 Bottom surface

452 Air channel seal race

454 Beer channel seal race

500 Fifth embodiment

502 Beer channel

504 Air channel

506 Beer outlet

510 Unitary body

518 Second coupling

520 First coupling

550 Bottom surface

552 Air channel seal race

554 Beer channel seal race

556 Toroidal channel

558 Junction

560 Outlet channel narrow segment

562 Outlet channel wide segment

564 Plug/alignment pin

566 Lower opening air channel

568 Upper opening air channel

570 Lower opening beer channel

600 Fifth embodiment

602 Beer channel

604 Air channel

606 Beer outlet

607 Beer outlet

608 Beer outlet

610 Unitary body

618 Second coupling

620 First coupling

650 Bottom surface

652 Air channel seal race

654 Beer channel seal race

656 Toroidal channel

658 Junction

660 Outlet channel narrow segment

662 Outlet channel wide segment

670 Lower opening beer channel

700 Seventh embodiment cylindrical projection

780 Smooth section

782 Cannula

784 Barb section

786 Barb

800 Eighth pressure regulator embodiment

802 Beer channel

804 Gas channel

806 Beer outlet

810 Body

818 Upper coupling

820 Lower coupling

856 Junction

862 Segment

890 Pressure relief valve and adjustment screw

892a High pressure inlet

893 Valve needle body

894 Valve needle

895 Valve O-ring

896 Valve Housing

897 Plunger

898 Plunger O-ring

900 High Pressure Spring

902 Low Pressure Spring

DETAILED DESCRIPTION

Fig. 1 is a bottom view of the adapter of the present invention according to a first embodiment for carrying out the invention. In the presently preferred embodiment and best mode presently contemplated for carrying out the invention, octopus device 100 has body 110, a

generally disc shaped body shown without perspective as a generally circular body. By means of a generally circular body, the device may easily screw in and out of conventional couplings on other devices. In other embodiments, the invention may be other shapes: a prism, irregular shapes, etc. Screw threads 101 are used to hold body 110 to other devices, and comprise the first, second and/or additional couplings on the lower surfaces and upper surfaces of the invention.

The body in the best mode now contemplated is metal, however, plastic may advantageously used and by this means material and manufacturing costs may be reduced. Other materials such as wood, composites, etc, may also be utilized without departing from the scope of the appended claims. It is important that the material be "food grade" and thus meet all requirements for food handling devices. In particular, food grade stainless steel is used in the embodiment now in testing, while high density polyethylene (HDPE) is favored for certain alternative embodiments.

Pressure of the flow through the tap device and the entire keg is important in the invention, therefore the preferred embodiment features an otherwise optional pair of gaskets, seals or O-rings: beer flow gasket 103 and air gasket 105. These may be generally toroidal bodies having a circular, square, generally flat or other convenient cross-section. Selection, placement, and use of such seals may be varied depending upon the configuration of the embodiment of the present invention, exact pressures to be contained and other factors. Such factors regarding seals, shape of the body, materials, and other factors mentioned herein all fall within the scope of the appended claims and may be determined by one skilled in the art without undue experimentation.

Channels pass wholly or partially through body 110. Beer channel 102 allows beer to pass into body 110 from the device below (for example, from a Sanke adaptor). Air channel 104 allows air or another gas such as CO_2 to flow into the device below from body 110. In the first embodiment, air channel 104 passes entirely through body 110 from the upper surface (not seen) to the lower surface shown in Fig. 1. By means of these various devices, a coupling on the upper surface is created which provides fluidic connection between the invention and the beer flow device above it, and a similar coupling on the lower surface is created which provides fluidic connection between the invention and the beer flow device below it. Fig. 2 is a is a cross-sectional view of the adapter of the present invention according to the first embodiment. As may be seen, beer channel 102 divides at junction 109 to supply beer to a multiplicity of beer outlets 106, 107, 108. By this device beer may be supplied to a multiplicity of faucet hose lines dimensioned and configured to fluidically connect to beer outlets 106, 107, 108.

Fig. 3 is a side view of the adapter of the present invention according to the second embodiment, showing the device in use. Adapter 200 has a plurality of beer outlets such as outlet 206, 208. Couplers 218, 220 physically connect the adapter to the devices above and below it. The lower portion 222 of coupler 220 may be part of shank 224 of a Sanke adapter (not seen). The physical connections referred to include fluidic connections between the beer channel present in one beer flow device and the beer channel present in the connected device, and between the air channel present in one device and air channel present in the connected device.

Pump 212 sits atop octopus adapter 200. Button 214 may be depressed in order force air down the air channels (internal and not shown in Fig. 3) of the pump, adapter, "coupler" and then

into the keg (not shown). Pressure in the keg then forces beer up the beer channels (internal and thus not shown in Fig. 3) of the "coupler" and adapter, from which the beer exits through the plurality of beer outlet ports such as beer outlet 206. As in previous embodiments discussed, beer outlet 206 may be dimensioned in size and configured in shape and form so as to accept a hose line to a beer faucet. Pump 212 may also have pressure relief valve 216 used when pressure in the tap system becomes too high.

In this particular embodiment, there may be a total of 2 beer outlets present, rather than 3 as in the first embodiment. Other embodiments may have more or less outlets present.

Fig. 4 is a side view of the adapter of the present invention according to a third embodiment, showing the device in use. This version of the invention teaches that a small CO_2 bottle may be utilized from a position directly atop the adaptor. Gases other than CO_2 may be used: N_2, etc. Adapter 300 has 2 outlet ports (beer outlets 306, 308). Coupling 320 may connect the adapter to a lower beer flow device having shank 324 which in turn has coupling lower portion 322. Coupling 318 may cooperate with coupling 332 of improved regulator 330.

CO_2 regulator 330 according to the invention may have coupling 334 adapted (dimensioned and configured) to mate with CO_2 bottle 340 and provide fluidic communication therebetween. Flow control device 336 may be an automatic pressure device designed to deliver a constant pressure to the tap (the keg/beer flow devices system) or it may be a simple button, a manually actuated valve, or similar devices. In use, pressurized CO_2 from bottle 340 flows down through the air channels of flow control device 336 and regulator 330 into adapter 300 and the device below it and thus to the beer keg. Pressure within the keg then forces beer upwards through the lowest device and its shank 324, through the beer channel of adapter 300 and out

beer outlets 306, 308. No pumping is necessary. Unlike other devices, there is no need for a large commercial CO_2 bottle placed on the ground somewhere near the keg and connected thereto by a CO_2 hose line. The "overkill" (excess capacity) of using a CO_2 bottle designed for a busy commercial soda fountain is also eliminated, as bottle 340 is properly sized to the beer keg to be emptied. The volumetric capacity of the keg, the volumetric capacity of bottle 340, the pressure sustainable in the system, the pressure held by bottle 340 and the diameters of the "air" (gas) channels and the diameters of the beer channels of the various devices may all be considered in selecting the size of the relatively small CO_2 bottle.

In a related alternative embodiment of the present invention, the octopus adapter may be eliminated in favor of a conventional faucet system, and the pump of the invention (utilizing a sized CO_2 bottle) may be modified to provide a beer channel and a single beer outlet. In yet a further sub-embodiment, the CO_2 pump aspect of the invention may provide a beer channel and multiple beer outlets in a single body.

Fig. 5 is a side view of the adapter of the present invention according to a fourth embodiment 400, while Fig. 6 is a bottom elevational perspective view of the fourth embodiment 400 of the invention, showing additional details. Adapter 400 has screw threads 401, beer channel 402, air channel 404, beer outlets 406, 407, 408 all parts of unitary body 410. Second coupling 418 is a solidly attached part of unitary body 410 in this embodiment, a measure which substantially saves manufacturing time, effort and cost. In alternative embodiments, second coupling 418 may be a rotating collar such as is common on the upper end of a Sanke Adapter (the flow device below) allowing rotation of the coupling without rotation of the body of the device. First coupling 420, at the lower/bottom end of unitary body 410 has threads 401

complementary to those of such a collared end Sanke Adapter (not pictured). This provides a definite sequence in which this embodiments and similar (non-collared second coupling) embodiments are used: the device of the invention is rotated as a unit to attach to the bottom end of a flow device above it, such as a pump. Then the lower end of first coupling 420 is placed within the mouth of the collar of the Sanke adapter or other flow device below, and the collar is rotated to engage, then tighten, the complementary threading of the Sanke adapter collar and first coupling 420. By this process, the Sanke adapter body (below/within the collar) is brought snugly and tightly against bottom surface 450.

As a note, it will be appreciated that in the prior art devices (with the octopus adapter retrofit of the invention not present) the Sanke adapter attaches directly to the pump above. The retrofit of the octopus adapter of the invention to the assembly comprises taking the Sanke adapter and the pump apart, then putting the invention therebetween. Thus, the first coupling 420 is a functional copy of the bottom coupling of the pump above, while the second coupling 418 is a functional copy (in this embodiment without the rotating collar) of the top coupling of the Sanke adapter below.

Bottom surface 450 has air channel seal race 452, beer channel seal race 454, into which O-rings or other seals of rubber, plastic, other polymer, metal, composites or combinations thereof may be inserted. This assures an air and beer tight connection of the device to the flow device below.

Fig. 7 is a cross sectional side view of a fifth embodiment 500 of the invention in a first sectional plane, not having external projections as part of the unitary body 510. Fifth embodiment octopus adapter 500 has beer channel 502, air channel 504, beer outlet 506, unitary

body 510 through which these channels pass, second coupling 518, first coupling 520, bottom surface 550, air channel seal race 552, and beer channel seal race 554. It also has toroidal channel 556. Since in the preferred embodiments such as the fourth and fifth embodiments, the adapter 500 is rotated as a unitary body onto the pump or other flow device above, lining up the upper opening 568 of the air channel 504 would be impossible in most circumstances. Thus toroidal channel 556 eliminates the angular alignment issue by allowing the air channel of the flow device above to end up at any relationship of rotational angle to the octopus adapter and yet still allow air flow therebetween. Air (or other gas) from the flow device above may pass through toroidal channel 556 to air channel upper opening 568 and there to air channel 504, and through unitary body 510, passing out through lower air channel opening 566.

Junction 558 allows free flow of beer from the lower opening 570 of beer channel 502, through beer channel 502, and thence to a multiplicity of beer outlets such as outlet 506 via outlet channel narrow segment 560 and similar items not shown since they are not in the cross sectional plane shown in Figure 7.

Outlet channel narrow segment 560 gives way to outlet channel wide segment 562, which may omitted in embodiments in which an extra insert such as a barb, hose, tap or other fitting is not to be fitted into unitary body 510. Fitting of such barbs or other projections is discussed below in reference to Figure 9.

Plug/alignment pin 564 is an option which is not present in the presently most preferred embodiment. This device fits up through a beer channel lower outlet port (not shown) of a flow device above the octopus adapter. This blocks that channel and further assists alignment, if needed, during the operation of screwing the embodiment onto the upper flow device.

Lower opening beer channel 570 may accept beer from the lower flow device such as an adapter, "keg tap" or similar device.

Fig. 8 is a partial and transparent side view of a sixth embodiment of the invention in a second sectional plane, in which the air channels previously invisible in the embodiment shown in Fig. 7 are visible. Unitary body 610 has air channel 604 and beer channel 602. Beer channel 602 may be seen to run to junction 658, from which beer outlets 606, 607, 608 branch. Outlet channel narrow segment 660 and outlet channel wide segment 662 in sequence branch therefrom to reach beer outlet 606, other segments reach outlets 607, 608.

It will be seen that the segments which branch from beer channel 602 are angled at an angle somewhat in excess of 90 degrees. Experimentation has determined that this slight angle has a surprisingly positive effect on beer flow. Without wishing to be bound by any particular theory, it is believed that this angle (substantially ranging from 100 to 135 degrees) promotes laminar flow and reduces turbulence.

Reduction of turbulence has an effect important to beer flow but not to the flow of most other liquids. Turbulence causes nucleation and bubbling of the gas in the beer, thus causing the beer to emerge with foam and bubbles therein and a lower gas content than intended, not to mention providing a second cause of slower flow. Thus, reduction of turbulence and promotion of laminar flow is doubly important in this particular application.

Fig. 9 is a cross sectional side view of a cylindrical projection according to a seventh embodiment 700 of the invention. Seventh embodiment cylindrical projection 700 has smooth section 780, cannula 782, barbed section 784, and barb 786. Smooth section 780 may fit into an outlet port such as port 606 of the previous embodiment. Smooth section 780 may be of

substantially the same diameter as wide segment 662, so that embodiment 700 may be combined with unitary body 610 at the time of manufacture or later. Barbed section 784 and barb 786 may be dimensioned and configured to accept thereon a standard size of beer hose, such as is customarily used with a portable hand tap. Alternative embodiments of the octopus adapter may have wide segment 662 dimensioned and configured to accept a hose directly, to accept a tap directly, and so on.

Fig. 10 is a top elevational perspective view of an eighth embodiment of the present invention. Fig. 11 cross sectional and top elevational perspective view of the eighth embodiment of the present invention. This embodiment is a pressure regulator for connection to the sized gas bottle embodiment. Eighth pressure regulator embodiment 800 has body 810, upper coupling 818, lower coupling 820 in turn having beer channel 802, junction 856 and segment 862 leading to beer outlet 806. Pressure relief valve and adjustment screw 890 is used not just as a safety device but also to adjust the tension of low pressure spring 902. High pressure inlet 892a allows pressure to pass valve needle body 893, valve O-ring 895 and then valve needle 894 and thereby exit valve housing 896 and into the low pressure half of the regulator. Plunger 897 has plunger O-ring 898; O-rings 895 and 898 seal the system.

High pressure spring 900 and low pressure spring 902 cooperate to regulate the final pressure passing out of the device via gas channel 804.

Beer channel 802, junction 856 and segment 862 are of construction and layout similar to other embodiments, with other segments and outlet ports not seen in this view. This embodiment is for use with the gas cartridge embodiments discussed earlier.

The disclosure is provided to allow practice of the invention by those skilled in the art

without undue experimentation, including the best mode presently contemplated and the presently preferred embodiment. Nothing in this disclosure is to be taken to limit the scope of the invention, which is susceptible to numerous alterations, equivalents and substitutions without departing from the scope and spirit of the invention. The scope of the invention is to be understood from the claims accompanying the corresponding utility application to be filed at a later date.